

REMARKS

Claims 1-14 are pending in this application. By this Amendment, claim 5 is amended and new claims 9-14 are added. No new matter is added.

ALLOWABLE SUBJECT MATTER

Applicants thank the Examiner for the indication that claims 2, 4, 6 and 8 would be allowable if rewritten in independent form. Because the remainder of the pending claims are allowable at least for the reasons discussed below, Applicants respectfully submit that the entire application is in condition for allowance.

SECTION 103 REJECTIONS

The Office Action rejects claims 1 and 5 under 35 U.S.C. § 103(a) as being unpatentable over Arnold et al. (U.S. Patent No. 6,195,999) in view of Tsutsumi et al. (U.S. Patent No. 5,366,820). Somewhat similarly, the Office Action rejects claims 3 and 7 under 35 U.S.C. § 103(a) as being unpatentable over Arnold et al. in view of Tsutsumi et al. and further in view of Snow et al. (U.S. Patent No. 6,589,312). These rejections are traversed.

Present claims 1-4 require, inter alia, "...a first hydrogen storage vessel having a first hydrogen absorbing material (MH1) that can store and release hydrogen; a catalytic combustor **that heats the first hydrogen storage vessel** so as to release hydrogen in order to supply hydrogen to [a] fuel cell; and a second hydrogen storage vessel having a second hydrogen absorbing material (MH2) that can store and release hydrogen and has a hydrogen release temperature that is lower than that of the first hydrogen absorbing material, **the second hydrogen storage vessel releasing hydrogen as a**

fuel for [a] catalytic combustor **under heating** by waste heat from the fuel cell..." (see claim 1, emphasis added). Present claims 5-8 require, inter alia, "...a first means for storing hydrogen, said means having a first hydrogen absorbing material (MH1) that can store and release hydrogen; a catalytic combustor **that heats the first hydrogen storage vessel** so as to release hydrogen in order to supply hydrogen to [a] fuel cell; and a second means for storing hydrogen, said second means for storing hydrogen having a second hydrogen absorbing material (MH2) that can store and release hydrogen and has a hydrogen release temperature that is lower than that of the first hydrogen absorbing material, the second means for storing hydrogen releasing hydrogen as a fuel for the catalytic combustor **under heating** by waste heat from the fuel cell ..." (see claim 5, emphasis added). Thus, the present claims require that the system or apparatus heat both first and second hydrogen absorbing materials at the same time.

As the Office Action notes, Arnold et al. "does not disclose that [a] second hydrogen absorbing material has a hydrogen release temperature that is lower than that of the first hydrogen absorbing material." However, the Office Action asserts that Tsutsumi et al. "teaches that [a second hydrogen storage] device (66) contains an alloy which desorbs hydrogen at a higher temperature than the alloy of [a first hydrogen storage] device (65)."

However, Applicants respectfully note that Arnold et al. is specifically describes the inclusion of two or more identical storage tanks, which are never used at the same time, in order to make refilling of one of the tanks easier. In particular, Arnold et al. only disclose "superheating only one of the storage tanks [22 and 22'] at a time to release

the balance of the hydrogen stored therein... [and thus once] the first storage tank 22 is depleted ..., the second storage tank 22' is superheated to release the balance of the hydrogen stored therein..." (see column 5, lines 41-66). Thus, the hydrogen is never released from the two storage tanks at the same time. In fact, Arnold et al. point out that "[c]oncurrently, while the second storage tank 22' is superheated, the first storage tank 22 is cooling from the superheated release temperature [and t]herefore, when the vehicle is brought to the refueling station 50, the first storage tank 22 may already be cooled to the hydrogen-storage temperature for refueling" (see column 6, lines 5-10). As Arnold et al. note, their system "allows the storage tank 22 to be refilled with hydrogen to its capacity without unreasonable delay to the consumer" (column 6, lines 33-35). Thus, Arnold et al. teach actually against heating both tanks at the same time. Furthermore, heating both tanks at the same time would destroy the advantages provided by the Arnold et al. embodiment having two tanks.

Thus, it is respectfully submitted that it would not have been obvious to heat both Arnold et al. tanks at the same time. Thus, it would not have been obvious to combine the teachings of Arnold et al. with teachings directed to heating two tanks at the same time. Similarly, as the present claims require an apparatus or system that heats two tanks at the same time, it is respectfully submitted that the presently claimed invention would not have been obvious over Arnold et al. in view of any other reference or references, including Tsutsumi et al. and/or Snow et al.

For at least these reasons, the presently claimed invention would not have been obvious over Arnold et al. in view of Snow et al.

For at least the above reasons, reconsideration and withdrawal of the rejections of claims 1 and 5 under 35 U.S.C. § 102(e) and of claims 4 and 7 under 35 U.S.C. 103(a) are respectfully requested.

New Claims 9-14

Applicants have added new claims 9-14 including one set of claims (claims 9-11) dependent on claim 1 and another set (claims 12-14) dependent on claim 5.

Regarding the feature recited in claims 9 and 12, Applicants respectfully note that in the embodiment of the drawings, there is no line established between the second hydrogen storage vessel 19 and the fuel cell 2 for supplying hydrogen from the former to the latter. By contrast, Arnold et al. teach that hydrogen is supplied from both of two storage tanks 22 and 22' to the fuel cell stack 12.

As regards the feature of claims 10 and 13, there is no dotted line that is directed from the fuel cell 2 to the first hydrogen storage vessel 11 that should permit waste heat to be fed from the cell 2 to the vessel 11. Arnold et al. show at Fig. 3 that unconsumed hydrogen is routed through line 19 to the heat generator 42 for catalytic combustion therein. Both the storage tanks 22, 22' are heated thereby. See column 3, lines 63-66.

Concerning the feature of claims 12 and 14, Fig. 4 shows the normal operation of the fuel cell 2 where hydrogen is supplied from the second hydrogen storage vessel 19 to the catalytic combustor 17 via line 21.

It should also be noted that Tsutsumi et al., which is relied upon by the Examiner in rejecting claims 1 and 5 on file, fail to teach or suggest use of waste heat that comes from the fuel cell.

Conclusion

Applicants respectfully submit that this application is in condition for allowance and such action is earnestly solicited. If the Examiner believes that anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicants' undersigned representative at the telephone number listed below to schedule a personal or telephone interview to discuss any remaining issues.

Please charge any fee deficiency or credit any overpayment to Deposit Account No. 01-2300, making reference to Attorney Docket No. 107348-00151.

Respectfully submitted,

A handwritten signature in black ink, reading "Robert K. Carpenter". The signature is fluid and cursive, with the first name "Robert" and last name "Carpenter" clearly distinguishable.

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